REMARKS

The present application was filed on July 30, 2003 with claims 1-21. Claims 1, 8 and 15 are the independent claims.

In the outstanding Office Action, the Examiner: (i) rejected claims 1, 3-8, 10-15 and 17-21 under 35 U.S.C. §101 as being directed to non-statutory subject matter; and (ii) rejected claims 1, 3-8, 10-15 and 17-21 under 35 U.S.C. §102(e) as being anticipated by a U.S. Patent Application Publication No. 2004/0181519 (hereinafter "Anwar").

Applicants respectfully traverse both the §101 and §102(e) rejections.

Independent claim 1 recites a method of mining attribute associations in a relational data set, comprising the steps of obtaining multiple items from the relational data set, and discovering attribute associations using: (i) multi-attribute mining templates formed from at least a portion of the multiple items; and (ii) one or more mining preferences specified by a user; wherein the multi-attribute mining templates are related by an anti-monotonicity property such that the property holds when mining top-down from k-itemsets to $(k+1)$-itemsets and when mining items defined by a set of k attributes to items defined by $k+1$ attributes.

With regard to the §101 rejection of claim 1, Applicants point out that the multiple items from the relational data set of the claimed invention can be considered as the objects being manipulated. The tangible result of the multiple items manipulation is the discovery of attribute associations using multi-attribute mining templates formed from at least a portion of the multiple items, and using one or more mining preferences specified by a user.

The claimed invention is clearly patentable subject matter under §101. As far as a practical application, the claim plainly recites that the method is directed toward mining attribute associations in a relational data set, i.e., data mining. Data mining is clearly a practical application. Furthermore, the attribute association discovery step is clearly performed using multi-attribute mining templates formed from at least a portion of the multiple items and one or more mining preferences specified by a user. Thus, every requirement specified by the Federal Circuit in the State Street decision is present in the claim, i.e., a useful, concrete and tangible result.

Accordingly, withdrawal of the §101 rejection is respectfully requested.

With respect to the §102(e) rejection, Applicants note that MPEP §2131 specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing <u>Verdegaal Bros. v. Union Oil Co. of California</u>, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing <u>Richardson v. Suzuki Motor Co.</u>, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicants respectfully traverse the §102(e) rejection on the ground that the Anwar reference fails to teach or suggest each and every limitation of claims 1, 3-8, 10-15 and 17-21 as alleged.

Regarding the §102(e) rejection of claim 1, each and every one of the above-noted limitations of claim 1 fails to be anticipated by the teachings of Anwar.

First, Anwar does not disclose <u>multi-attribute mining templates formed from at least a portion of the multiple items [from the relational data set]</u>, as recited in the claimed invention.

In characterizing the Anwar reference as allegedly meeting the "multi-attribute mining template formed from a portion of the multiple items [from the relational data set]" limitation of claim 1, the Examiner relies primarily on paragraph [0095] and [0096] of Anwar, which state:

> [0095] These optional applied rules can be defined by clicking the Rules tab 418. Measure rules provide the user with a means to limit the result set based on specific criteria applied to one or more measures. This is particularly useful for measure that are a ratio of two other measures. For example, assume the selected measure is Average Sales (Sales divided by Sales Count). Averages can be very misleading when the number of samples is very small. By using measure rules, the user can specify that Sales Count must be greater than sum cutoff such as 10, thus, ensuring a reasonable sample size for the average . . . [0096] Referring to FIG. 4C, a rule definition screen 420 is shown to include a rules tab window 421 including a list of Measure Level list 422, where the Sales Count level has been selected activating a pull down or drop down menu 423 and associated display window 424. The menu 423 produces a rule template list 425. From the drop-down list 425 you can select an appropriate operator as well as a target value in a target value definition window 426. It is possible to define one or more rules on any specific measure, just click on the measure of interest. Multiple rules can be associated with multiple measures and multiple rules per measure are allowed. The wizard is advanced by pressing the NEXT button associated with control buttons 428. The control buttons 428 will highlight on those buttons that are active in the particular wizard window.

Clearly, any template referred to here by Anwar has to do with a <u>rule definition screen</u> such that one or more rules can be defined. How the rule template and rule definition screen of Anwar meet the claim limitation of a "multi-attribute mining template formed from a portion of the multiple items [from the relational data set]" is completely unclear to Applicants.

By way of example, as illustratively disclosed in the present specification at page 8, line 20, through page 9, line 7, the inventive mining approach introduces the concept of a multi-attribute mining template to identify particular forms of attribute associations. For instance, pattern R_1 is an instance of template (EVENTTYPE, HOST), as R_1 contains a single item described by two attributes, EVENTTYPE and HOST. Similarly, pattern R_2 is an instance of template (CATEGORY; HOST) (EVENTTYPE, HOST), as it contains two items each described by a set of attributes. Under traditional association rule mining, each item can be viewed as having only one attribute, item name, so there is no need to define templates based on attributes. Multi-attribute association mining, according to an illustrative embodiment of the invention, centers around attribute templates because: (i) once candidate generation and pruning are localized to each template, mining performance can be improved; and (ii) user preferences can be incorporated into the mining process. A user can specify desired mining templates and irrelevant mining templates by using a rule-like language. As a result, the search space can often be reduced significantly.

Thus, it is clear that the rule definition screen and rule template list of Anwar is completely unrelated to the claimed multi-attribute mining template.

Furthermore, Anwar is cited as disclosing an anti-monotonicity property. However, since Anwar does not disclose multi-attribute mining templates, as explained above, Anwar cannot therefore disclose multi-attribute mining templates related by an anti-monotonicity property.
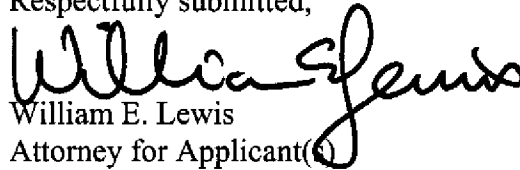
Still further, Anwar does not disclose that the anti-monotonicity property holds when mining top-down from k-itemsets to ($k + 1$)-itemsets and when mining items defined by a set of k attributes to items defined by $k + 1$ attributes, as in the claimed invention.

For at least the above reasons, Applicants traverse the rejections of independent claims 1, 8 and 15 and believe that such claims are patentable over the cited reference. Withdrawal of the rejection is therefore respectfully requested.

In addition, Applicants assert that the claims which depend from independent claims 1, 8 and 15, namely claims 3-7, 10-14 and 17-21, are patentable over the cited reference not only for the above reasons, but also because such dependent claims recite patentable subject matter in their own right.

In view of the above, Applicants believe that claims 1-21 are in condition for allowance, and respectfully request withdrawal of the §101 and §102(e) rejections.

Respectfully submitted,

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